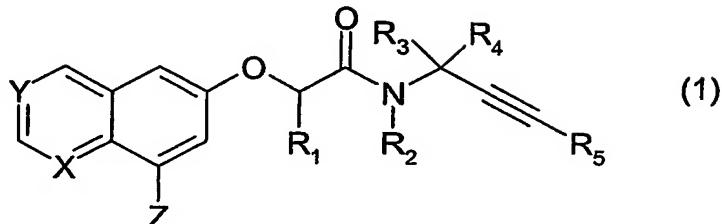


CLAIMS

1. A compound of the general formula (1):



wherein one of X and Y is N or N-oxide and the other is CR or both of X and Y are N;

Z is H, halo, C₁₋₆ alkyl optionally substituted with halo or C₁₋₄ alkoxy, C₃₋₆ cycloalkyl optionally substituted with halo or C₁₋₄ alkoxy, C₂₋₄ alkenyl optionally substituted with halo, C₂₋₄ alkynyl optionally substituted with halo, C₁₋₆ alkoxy optionally substituted with halo or C₁₋₄ alkoxy, C₂₋₄ alkenyloxy optionally substituted with halo, C₂₋₄ alkynyoxy optionally substituted with halo, cyano, nitro, C₁₋₄ alkoxycarbonyl, -OSO₂R', S(O)_nR', -COR'', -CONR''R'', -CR''=NOR', NR''R'', NR''COR', NR''CO₂R' where n is 0, 1 or 2, R' is C₁₋₆ alkyl optionally substituted with halogen and R'' and R''' are independently H or C₁₋₆ alkyl or, in the case of -CONR''R'', may join to form a 5- or 6-membered ring containing a single nitrogen atom, saturated carbon atoms and optionally a single oxygen atom;

10 R is H, halo, C₁₋₈ alkyl, C₃₋₆ cycloalkyl, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₁₋₈ alkoxy, C₁₋₈ alkylthio, nitro, amino, mono- or di-(C₁₋₆)alkylamino, mono- or di-(C₂₋₆)alkenyl-amino, mono- or di-(C₂₋₆)alkynylamino, formylamino, C₁₋₄ alkyl(formyl)amino, C₁₋₄ alkylcarbonylamino, C₁₋₄ alkoxycarbonylamino, C₁₋₄ alkyl(C₁₋₄ alkyl-carbonyl)amino, cyano, formyl, C₁₋₄ alkylcarbonyl, C₁₋₄ alkoxycarbonyl, amino-carbonyl, mono- or di-(C₁₋₄)alkylaminocarbonyl, carboxy, C₁₋₄ alkylcarbonyloxy, aryl(C₁₋₄)alkylcarbonyloxy, C₁₋₄ alkylsulphanyl, C₁₋₄ alkylsulphonyl or C₁₋₄ alkyl-sulphonyloxy;

15 R₁ is C₁₋₄ alkyl, C₂₋₄ alkenyl or C₂₋₄ alkynyl in which the alkyl, alkenyl and alkynyl groups are optionally substituted on their terminal carbon atom with one, two or three halogen atoms, with a cyano group, with a C₁₋₄ alkylcarbonyl group, with a C₁₋₄ alkoxycarbonyl group or with a hydroxy group, or

20 R₁ is alkoxyalkyl, alkylthioalkyl, alkylsulphinylalkyl or alkylsulphonylalkyl in

25

which the total number of carbon atoms is 2 or 3, or
R₁ is a straight-chain C₁₋₄ alkoxy group;
R₂ is H, C₁₋₄ alkyl, C₁₋₄ alkoxymethyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C₁₋₄ alkoxy;

5 R₃ and R₄ are independently H, C₁₋₃ alkyl, C₂₋₃ alkenyl or C₂₋₃ alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or

R₃ and R₄ join with the carbon atom to which they are attached to form a 3 or 4 membered carbocyclic ring optionally containing one O, S or N atom and
10 optionally substituted with halo or C₁₋₄ alkyl; and

R₅ is H, C₁₋₄ alkyl or C₃₋₆ cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C₁₋₆ alkoxy, cyano, C₁₋₄ alkylcarbonyloxy, aminocarbonyloxy, mono- or di(C₁₋₄)alkylaminocarbonyloxy, -S(O)_n(C₁₋₆)-alkyl where n is 0, 1 or 2, triazolyl (e.g. 1,2,4-triazol-1-yl), tri(C₁₋₄)alkylsilyloxy,
15 optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or

R₅ is optionally substituted phenyl, optionally substituted thienyl or optionally substituted benzyl,
in which the optionally substituted phenyl and thienyl rings of the R₅ values are
20 optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C₁₋₄ alkyl, C₂₋₄ alkenyl, C₂₋₄ alkynyl, C₁₋₄ alkoxy, C₂₋₄ alkenyloxy, C₂₋₄ alkynyloxy, halo(C₁₋₄)alkyl, halo(C₁₋₄)alkoxy, C₁₋₄ alkylthio, halo(C₁₋₄)alkylthio, hydroxy(C₁₋₄)alkyl, C₁₋₄ alkoxy(C₁₋₄)alkyl, C₃₋₆ cycloalkyl,
25 C₃₋₆ cycloalkyl(C₁₋₄)alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thiocyanato, isothiocyanato, nitro, -NR^mRⁿ, -NHCOR^m, -NHCONR^mRⁿ, -CONR^mRⁿ, -SO₂R^m, -OSO₂R^m, -COR^m, -CR^m=NRⁿ or -N=CR^mRⁿ, in which R^m and Rⁿ are independently hydrogen, C₁₋₄ alkyl, halo(C₁₋₄)alkyl, C₁₋₄ alkoxy, halo-(C₁₋₄)alkoxy, C₁₋₄ alkylthio, C₃₋₆ cycloalkyl, C₃₋₆ cycloalkyl(C₁₋₄)alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen,
30 C₁₋₄ alkyl or C₁₋₄ alkoxy.

2. A compound according to claim 1 wherein R₅ is other than H.

3. A compound according to claim 1 or 2 wherein R is H or halo, cyano.
4. A compound according to any one of the preceding claims wherein R₁ is methyl,
5 ethyl, *n*-propyl, 2,2,2-trifluoromethyl, cyanomethyl, acetylmethyl, methoxycarbonylmethyl, methoxycarbonylethyl, hydroxymethyl, hydroxyethyl, methoxymethyl, methylthiomethyl, ethoxymethyl, 2-methoxyethyl, 2-methylthioethyl, methoxy, ethoxy, *n*-propoxy or *n*-butoxy.
- 10 5. A compound according to any one of the preceding claims wherein R₁ is ethyl, methoxy, ethoxy or methoxymethyl.
6. A compound according to any one of the preceding claims wherein R₂ is H.
- 15 7. A compound according to any one of the preceding claims wherein both R₃ and R₄ are methyl.
8. A compound according to any one of the preceding claims wherein R₅ is H, methyl, hydroxymethyl, methoxymethyl, 1-methoxyethyl, *tert*-butyldimethyl-
20 siloxymethyl, 3-cyanopropyl, 3-methoxypropyl, 3-(1,2,4-triazol-1-yl)propyl, 3-methylthiopropyl, 3-methanesulphinylpropyl or 3-methanesulphonylpropyl.
9. A compound according to claim 1 wherein one of X and Y is N and the other is CR or both of X and Y are N;
25 Z is H;
R is H, halo, C₁₋₈ alkyl, C₃₋₆ cycloalkyl, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₁₋₈ alkoxy, C₁₋₈ alkylthio, nitro, amino, mono- or di-(C₁₋₆)alkylamino, mono- or di-(C₂₋₆)-alkenylamino, mono- or di-(C₂₋₆)alkynylamino, formylamino, C₁₋₄ alkyl(formyl)-amino, C₁₋₄ alkylcarbonylamino, C₁₋₄ alkyl(C₁₋₄ alkylcarbonyl)amino, cyano, formyl, C₁₋₄ alkylcarbonyl, C₁₋₄ alkoxy carbonyl, aminocarbonyl, mono- or di-(C₁₋₄)alkylaminocarbonyl, carboxy, C₁₋₄ alkylcarbonyloxy, aryl(C₁₋₄)alkyl-carbonyloxy, C₁₋₄ alkylsulphinyl, C₁₋₄ alkylsulphonyl or C₁₋₄ alkylsulphonyloxy;

- R₁ is C₁₋₄ alkyl, C₂₋₄ alkenyl or C₂₋₄ alkynyl in which the alkyl, alkenyl and alkynyl groups are optionally substituted on their terminal carbon atom with one, two or three halogen atoms, with a cyano group, with a C₁₋₄ alkylcarbonyl group, with a C₁₋₄ alkoxy carbonyl group or with a hydroxy group, or
- 5 R₁ is alkoxyalkyl, alkylthioalkyl, alkylsulphinylalkyl or alkylsulphonylalkyl in which the total number of carbon atoms is 2 or 3, or R₁ is a straight-chain C₁₋₄ alkoxy group;
- R₂ is H, C₁₋₄ alkyl, C₁₋₄ alkoxy methyl or benzyloxymethyl in which the phenyl ring of the benzyl moiety is optionally substituted with C₁₋₄ alkoxy;
- 10 R₃ and R₄ are independently H, C₁₋₃ alkyl, C₂₋₃ alkenyl or C₂₋₃ alkynyl provided that both are not H and that when both are other than H their combined total of carbon atoms does not exceed 4, or
- R₃ and R₄ join with the carbon atom to which they are attached to form a 3 or 4 membered carbocyclic ring optionally containing one O, S or N atom and optionally substituted with halo or C₁₋₄ alkyl; and
- 15 R₅ is H, C₁₋₄ alkyl or C₃₋₆ cycloalkyl in which the alkyl or cycloalkyl group is optionally substituted with halo, hydroxy, C₁₋₆ alkoxy, C₁₋₆ alkylthio, cyano, C₁₋₄ alkylcarbonyloxy, aminocarbonyloxy or mono- or di(C₁₋₄)alkylaminocarbonyloxy, tri(C₁₋₄)alkyl-silyloxy, optionally substituted phenoxy, optionally substituted thienyloxy, optionally substituted benzyloxy or optionally substituted thienylmethoxy, or
- 20 R₅ is optionally substituted phenyl, optionally substituted thienyl or optionally substituted benzyl,
- 25 in which the optionally substituted phenyl and thienyl rings of the R₅ values are optionally substituted with one, two or three substituents selected from halo, hydroxy, mercapto, C₁₋₄ alkyl, C₂₋₄, alkenyl, C₂₋₄ alkynyl, C₁₋₄ alkoxy, C₂₋₄ alkenyloxy, C₂₋₄ alkynyoxy, halo (C₁₋₄)alkyl, halo(C₁₋₄)alkoxy, C₁₋₄ alkylthio, halo(C₁₋₄)alkylthio, hydroxy(C₁₋₄)alkyl, C₁₋₄alkoxy(C₁₋₄)alkyl, C₃₋₆ cycloalkyl, C₃₋₆ cycloalkyl(C₁₋₄)alkyl, phenoxy, benzyloxy, benzoyloxy, cyano, isocyano, thio-cyanato, isothiocyanato, nitro, -NR^mRⁿ, -NHCOR^m, -NHCONR^mRⁿ, -CONR^mRⁿ, -SO₂R^m, -OSO₂R^m, -COR^m, -CR^m=NRⁿ or -N=CR^mRⁿ, in which R^m and Rⁿ are independently hydrogen, C₁₋₄ alkyl, halo(C₁₋₄)alkyl, C₁₋₄ alkoxy, halo(C₁₋₄)alkoxy,
- 30

C₁₋₄ alkylthio, C₃₋₆ cycloalkyl, C₃₋₆ cycloalkyl(C₁₋₄)alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C₁₋₄ alkyl or C₁₋₄ alkoxy.

- 5 10. A compound according to claim 1 wherein one of X and Y is N and the other is CR or both of X and Y are N; Z is H; R is H, halo or cyano; R₁ methyl, ethyl, *n*-propyl, 2,2,2-trifluoromethyl, cyanomethyl, acetyl methyl, methoxycarbonyl-methyl, methoxycarbonyl ethyl, hydroxymethyl, hydroxyethyl, methoxymethyl, methylthiomethyl, ethoxymethyl, 2-methoxyethyl, 2-methylthioethyl, methoxy, ethoxy, *n*-propoxy or *n*-butoxy; R₂ is H; R₃ and R₄ are both methyl; and R₅ is H, methyl, hydroxymethyl, methoxymethyl, 1-methoxyethyl, *tert*-butyldimethyl-siloxymethyl, 3-cyanopropyl, 3-methoxypropyl, 3-(1,2,4-triazol-1-yl)propyl, 3-methylthiopropyl, 3-methanesulphinylpropyl or 3-methanesulphonylpropyl.
- 15 11. A process for preparing a compound according to claim 1 as herein described.
12. A fungicidal composition comprising a fungicidally effective amount of a compound of formula (1) as claimed in claim 1 or 9 and a suitable carrier or diluent therefor.
- 20 13. A method of combating or controlling phytopathogenic fungi which comprises applying a fungicidally effective amount of a compound of formula (1) as defined in claim 1 or a composition according to claim 12 to a plant, to a seed of a plant, to the locus of the plant or seed or to soil or any other plant growth medium.